

WHAT IS CLAIMED IS:

1. A current sense integrated circuit comprising an amplifier for amplifying a differential signal in the hundreds of millivolts near a high voltage power supply by converting the signal from a high voltage analog signal to a pulse width modulated signal and then level shifting the pulse width modulated signal from the high voltage to a low voltage.
2. The current sense integrated circuit of claim 1, wherein the amplifier comprises a circuit to minimize inherent temperature offset drift.
3. The current sense integrated circuit of claim 2, wherein the circuit to minimize inherent temperature offset drift comprises mirrored MOSFETs such that an offset voltage of the circuit is the difference between a gate-to-source voltage of the MOSFETs.
4. The current sense integrated circuit of claim 1, further comprising a high side current reference circuit.